

**AMENDMENTS TO THE CLAIMS**

Claim 1 (Previously Presented): An object-oriented virtual machine interface for a reconfigurable wireless network communication apparatus;

    said reconfigurable wireless network communication apparatus comprising a plurality of kernels, wherein each kernel is designed to perform a specific processing function; and

    said object-oriented virtual machine interface comprising a plurality of software objects including a first subset of said software objects, each software object in said first subset of said software objects associated with a different kernel in said plurality of kernels so that a change to a software object in said first subset of said software objects results in a change in said kernel associated with said software object.

Claim 2 (Original): The object-oriented virtual machine interface of claim 1 wherein said plurality of software objects includes a second subset of said software objects, each software object in said second subset of said software objects having at least one adjustable attribute.

Claim 3 (Previously Presented): The object-oriented virtual machine interface of claim 2 wherein said at least one adjustable attribute is a static or dynamic attribute.

**Claim 4 (Original):** The object-oriented virtual machine interface of claim 1 wherein a kernel in said plurality of kernels is configurable in accordance with a communication protocol.

**Claim 5 (Original):** The object-oriented virtual machine interface of claim 4 wherein said selected communication protocol is a CDMA (code division multiple access) protocol.

**Claim 6 (Original):** The object-oriented virtual machine interface of claim 4 wherein said communication protocol is selected from the group consisting of IS-95 CDMA, IS-95B CDMA, CDMA TIA IS2000, TIA IS 2000A, wideband CDMA (WCDMA), cdma2000, and ARIB-WCDMA.

**Claim 7 (Original):** The object-oriented virtual machine interface of claim 4 wherein said selected communication protocol is a time division multiple access (TDMA) protocol.

**Claim 8 (Original):** The object-oriented virtual machine interface of claim 7 wherein said communication protocol is IS-136 TDMA.

Claim 9 (Original): The object-oriented virtual machine interface of claim 1 wherein a software object in said plurality of software objects is a searcher object, a code generation unit object or a finger object.

Claim 10 (Original): The object-oriented virtual machine interface of claim 1 wherein a software object in said plurality of software objects is a matched filter object or a combiner object.

Claim 11 (Original): The object-oriented virtual machine interface of claim 1 wherein a software object in said plurality of software objects is an uplink object or a downlink object.

Claim 12 (Previously Presented): An object-oriented virtual machine interface for a reconfigurable wireless network communication apparatus;

    said reconfigurable wireless network communication apparatus comprising a plurality of kernels;

    said object-oriented virtual machine interface comprising a plurality of software objects including a first subset of said software objects, each software object in said first subset of said software objects associated with a different kernel in said plurality of kernels so that a change to a software object in said first subset of said software objects results in a change in said kernel associated with said software object;

said plurality of software objects comprising a searcher object, a code generation unit object, a finger object, a matched filter object, a combiner object, an uplink object and a downlink object; and

said plurality of kernels comprising a searcher kernel, a code generation unit kernel, a finger kernel, a matched filter kernel, a combiner kernel, an uplink kernel and a downlink kernel; wherein:

said searcher object is associated with said searcher kernel;

said code generation unit object is associated with said code generation unit kernel;

said finger object is associated with said finger kernel;

said matched filter object is associated with said matched filter kernel; said combiner object is associated with said combiner kernel;

said uplink object is associated with said uplink kernel; and

said downlink object is associated with said downlink kernel.

**Claim 13 (Previously Presented):** An object-oriented reconfigurable system comprising an object-oriented virtual machine interface, a virtual machine and a reconfigurable apparatus,

said reconfigurable apparatus coupled to said virtual machine and comprising a plurality of kernels, wherein each kernel is designed to perform a specific processing function; and

said object-oriented virtual machine interface coupled to said virtual machine and comprising a plurality of software objects including a first subset of said software objects, each software object in said first subset of said software objects associated with a different kernel in said plurality of kernels such that a change to a software object in said first subset of said software objects results in a change in said kernel associated with said software object.

Claim 14 (Original): The object-oriented reconfigurable system of claim 13 wherein said plurality of software objects includes a second subset of said software objects, each software object in said second subset of said software objects having at least one adjustable attribute.

Claim 15 (Original): The object-oriented reconfigurable system of claim 14 wherein said at least one adjustable attribute is a static or dynamic attribute.

Claim 16 (Original): The object-oriented reconfigurable system of claim 13 further comprising:

an application program interface comprising a plurality of software routines, each software routine in said plurality of software routines representing a different communication protocol, wherein said plurality of software routines comprise software calls to said plurality of software objects; and

an application program comprising software calls to said plurality of software routines.

Claim 17 (Original): The object-oriented reconfigurable system of claim 16 further comprising:

a compiler within said virtual machine to translate said application program into machine-readable instructions executable on said object-oriented reconfigurable system.

Claim 18 (Original): The object-oriented reconfigurable system of claim 17 further comprising:

a resource allocator within said object-oriented reconfigurable system, said resource allocator configured to receive said machine-readable instructions and issue a signal to configure a kernel in said plurality of kernels.

Claim 19 (Original): The object-oriented reconfigurable system of claim 13 further comprising:

an application program for utilizing said plurality of software objects.

Claim 20 (Original): The object-oriented reconfigurable system of claim 19 further comprising:

a compiler within said virtual machine to translate said application program into machine-readable instructions executable on said object-oriented reconfigurable system.

Claim 21 (Original): The object-oriented reconfigurable system of claim 20 further comprising:

a resource allocator configured to receive said machine-readable instructions, and issue a command signal to control a kernel in said plurality of kernels.

Claim 22 (Previously Presented): The object-oriented reconfigurable system of claim 13 wherein a software object in said plurality of software objects is a searcher object, a code generation unit object, a finger object, an uplink object or a downlink object.

Claim 23 (Previously Presented): An object-oriented reconfigurable system comprising an object-oriented virtual machine interface, a virtual machine and a reconfigurable apparatus,

said reconfigurable apparatus coupled to said virtual machine and comprising a plurality of kernels;

said object-oriented virtual machine interface coupled to said virtual machine and comprising a plurality of software objects including a first subset of said software objects, each software object in said first subset of said software objects associated with a different kernel in said plurality of kernels such that a change to a software object in

said first subset of said software objects results in a change in said kernel associated with said software object;

    said plurality of software objects in said first subset of said software objects comprising a searcher object, a code generation unit object, a finger object, a matched filter object, a combiner object, an uplink object and a downlink object; and

    said plurality of kernels comprising a searcher kernel, a code generation unit kernel, a finger kernel, a matched filter kernel, a combiner kernel, an uplink kernel and a downlink kernel; wherein:

        said searcher object is associated with said searcher kernel;

        said code generation unit object is associated with said code generation unit kernel;

        said finger object is associated with said finger kernel;

        said matched filter object is associated with said matched filter kernel;

        said combiner object is associated with said combiner kernel;

        said uplink object is associated with said uplink kernel; and

        and said downlink object is associated with said downlink kernel.

Claim 24 (Previously Presented): An object-oriented reconfigurable system comprising an object-oriented virtual machine interface, a virtual machine and a reconfigurable apparatus,

said reconfigurable apparatus coupled to said virtual machine and comprising a plurality of kernels; and

said object-oriented virtual machine interface coupled to said virtual machine and comprising a plurality of software objects including a first subset of said software objects, each software object in said first subset of said software objects associated with a different kernel in said plurality of kernels such that a change to a software object in said first subset of said software objects results in a change in said kernel associated with said software object,

wherein said plurality of kernels comprise a searcher kernel, a code generation unit kernel, a finger kernel, an uplink kernel and a downlink kernel.

Claim 25 (Original): The object-oriented reconfigurable system of claim 13 wherein a kernel in said plurality of kernels is configured to operate under a CDMA protocol.

Claim 26 (Original): The object-oriented reconfigurable system of claim 25 wherein said CDMA protocol is selected from the group consisting of IS-95 CDMA, IS-95B CDMA, CDMA TIA IS2000, TIA IS 2000A, wideband CDMA (WCDMA), cdma2000, and ARIB WCDMA.

Claim 27 (Original): The object-oriented reconfigurable system of claim 13 wherein a kernel in said plurality of kernels is configured to operate under a TDMA protocol.

Claim 28 (Original): The object-oriented reconfigurable system of claim 27 wherein said TDMA protocol is IS-136 TDMA.

Claim 29 (Previously Presented): A method of communication using an object oriented virtual machine interface and a reconfigurable multi-protocol communication apparatus, said reconfigurable multi-protocol communication apparatus including a plurality of kernels and an interconnect structure for interconnecting said plurality of kernels, said method comprising:

creating a plurality of software objects, each software object in said plurality of software objects corresponding to a different kernel in said plurality of kernels, wherein each kernel is designed to perform a specific processing function;

assigning an attribute value to a software object in said plurality of software objects in accordance with a communication protocol; and

configuring the kernel associated with said software object in accordance with said attribute value.

Claim 30 (Original): The method of claim 29 wherein at least two software objects in said plurality of software objects have a hierarchical relationship.

Claim 31 (Original): The method of claim 29 further comprising developing an application program that includes software calls to said plurality of software objects.

Claim 32 (Original): The method of claim 31 further comprising developing a software virtual machine to process said application program.

Claim 33 (Original): The method of claim 32 further comprising translating said application program into a program executable on said software virtual machine.

Claim 34 (Original): The method of claim 33 further comprising issuing, from said software virtual machine, an instruction for controlling a kernel in said plurality of kernels.

Claim 35 (Original) The method of claim 29 further comprising:

forming an application program interface comprising a plurality of software routines, said plurality of software routines representing a plurality of communication protocols, wherein said plurality of software routines comprise software calls to said plurality of software objects.

Claim 36 (Original): The method of claim 29 further comprising developing an application program comprising software calls to said plurality of software routines.

Claim 37 (Previously Presented): A computer program product for a reconfigurable object-oriented apparatus comprising a plurality of kernels and an interconnect structure for interconnecting said plurality of kernels, the computer program product comprising a computer readable storage medium and a computer program mechanism embedded therein, the computer program mechanism comprising:

instructions for instantiating a plurality of software objects, each software object in said plurality of software objects corresponding to a different kernel in said plurality of kernels such that a change to said software object results in a change in a state of said corresponding different kernel, wherein each kernel is designed to perform a specific processing function;

instructions for assigning an attribute value to a first software object in said plurality of objects according to a communication protocol; and

issuing machine-readable instructions to configure the kernel associated with said first software object in accordance with said attribute value.

Claim 38 (Original): The computer program product of claim 37, wherein the computer program mechanism further comprising instructions for:

instantiating a plurality of software routines from an application program interface, said plurality of software routines representing a plurality of standards, wherein said plurality of software routines comprise software calls to said plurality of software objects.

Claim 39 (Original): The computer program product of claim 37 wherein said plurality of software objects comprise:

- a searcher object;
- a code generation unit object;
- a finger object;
- an uplink object; and
- a downlink object.

Claim 40 (Previously Presented): A computer program product for a reconfigurable object-oriented apparatus comprising a plurality of kernels and an interconnect structure for interconnecting said plurality of kernels, the computer program product comprising a computer readable storage medium and a computer program mechanism embedded therein, the computer program mechanism comprising:

instructions for instantiating a plurality of software objects, each software object in said plurality of software objects corresponding to a different kernel in said plurality of kernels such that a change to said software object results in a change in a state of said corresponding different kernel;

instructions for assigning an attribute value to a first software object in said plurality of objects according to a communication protocol; and

issuing machine-readable instructions to configure the kernel associated with said first software object in accordance with said attribute value,

wherein said plurality of software objects comprise a searcher object, a code generation unit object, a finger object, an uplink object, and a downlink object, and

wherein said plurality of kernels comprise a searcher kernel, a code generation unit kernel, a finger kernel, an uplink kernel and a downlink kernel respectively corresponding to said searcher object, said code generation unit object, said finger object, said uplink object and said downlink object, respectively.

Claim 41 (Original): A computer program product of claim 39 wherein said communication protocol is CDMA.

Claim 42 (Withdrawn): An apparatus to facilitate wireless communication, comprising a hardware reconfigurable and software programmable processor responsive to a predetermined virtual machine interface.

Claim 43 (Previously Presented): A method for reconfiguring a wireless network communication apparatus having a plurality of kernels, the method comprising the steps of:

parsing an application program that designates a communication protocol;

producing machine readable data capable of reconfiguring said reconfigurable wireless network communication apparatus in accordance with said communication protocol; and

providing an object-oriented virtual machine interface having a plurality of software objects, each software object in said plurality of software objects associated with a different kernel in said plurality of kernels so that a change to a software object in said plurality of software objects results in a change in said kernel associated with said software object,

wherein each kernel is designed to perform a specific processing function, and

wherein said machine readable data includes a first software object selected from said plurality of software objects.

**Claim 44 (Canceled)**

**Claim 45 (Previously Presented):** The method of claim 43 wherein said first software object is a function or procedure.

**Claim 46 (Previously presented):** A computer program product for use in conjunction with a reconfigurable wireless network communication apparatus having a plurality of kernels, the computer program product comprising a computer readable storage medium and a computer program mechanism embedded therein, the computer program mechanism comprising:

a program module for reconfiguring said reconfigurable wireless network communication apparatus comprising:

instructions for parsing an application program that designates a communication protocol; and

instructions for producing machine readable data capable of reconfiguring said reconfigurable network communication apparatus in accordance with said communication protocol;

the computer program product further comprising an object-oriented virtual machine module comprising a plurality of software objects, each software object in said plurality of software objects associated with a different kernel in said plurality of kernels so that a change to a software object in said plurality of software objects results in a change in said kernel associated with said software object,

wherein each kernel is designed to perform a specific processing function, and

wherein said machine readable data include a first software object selected from said plurality of software objects.

Claim 47 (canceled)

Claim 48 (Previously Presented): The computer program product of claim 46 wherein said first software object is a function or procedure.

**Claim 49 (Previously Presented):** The method of claim 29 wherein a software object in said plurality of software objects is associated with at least two kernels in said plurality of kernels.

**Claim 50 (Previously Presented):** The method of claim 29 wherein at least two kernels in said plurality of kernels are associated with the same software object in said plurality of software objects.

**Claim 51 (Original):** The object-oriented reconfigurable system of claim 13 wherein a software object in said plurality of software objects is associated with at least two kernels in said plurality of kernels.

**Claim 52 (Previously Presented):** The object-oriented reconfigurable system of claim 13 wherein at least two kernels in said plurality of kernels are associated with the same software object in said plurality of software objects.

**Claim 53 (Previously Presented):** The object-oriented virtual machine interface of claim 1 wherein a software object in said plurality of software objects is a searcher object or a finger object.

Claim 54 (Previously Presented): The object-oriented virtual machine interface of claim 1 wherein a software object in said plurality of software objects is a matched filter object.

Claim 55 (Previously Presented): The object-oriented reconfigurable system of claim 13 wherein a software object in said plurality of software objects is a searcher object, a finger object, an uplink object or a downlink object.

Claim 56 (Previously Presented): The object-oriented virtual machine interface of claim 1, wherein the kernels may be configured for different parameters dynamically.

Claim 57 (Previously Presented): The object-oriented reconfigurable system of claim 13, wherein the kernels may be configured for different parameters dynamically.

Claim 58 (Previously Presented): The method of claim 29, wherein the kernels may be configured for different parameters dynamically.

Claim 59 (Previously Presented): The computer program product of claim 37, wherein the kernels may be configured for different parameters dynamically.

Claim 60: (Previously Presented): The method of claim 43, wherein the kernels may be configured for different parameters dynamically.

**Claim 61 (Previously Presented):** The computer program product of claim 46, wherein the kernels may be configured for different parameters dynamically.

**Claim 62 (Previously Presented):** The object-oriented virtual machine interface of claim 1, wherein the software objects may be updated according to the states of their associated kernels dynamically.

**Claim 63 (Previously Presented):** The object-oriented reconfigurable system of claim 13, wherein the software objects may be updated according to the states of their associated kernels dynamically.

**Claim 64 (Previously Presented):** The method of claim 29, wherein the software objects may be updated according to the states of their associated kernels dynamically.

**Claim 65 (Previously Presented):** The computer program product of claim 37, wherein the software objects may be updated according to the states of their associated kernels dynamically.

**Claim 66: (Previously Presented):** The method of claim 43, wherein the software objects may be updated according to the states of their associated kernels dynamically.

Claim 67 (Previously Presented): The computer program product of claim 46, wherein the software objects may be updated according to the states of their associated kernels dynamically.

Claim 68 (Previously Presented): The object-oriented virtual machine interface of claim 1, wherein a change in a kernel of said plurality of kernels results in a change in the software object associated with that kernel.

Claim 69 (Previously Presented): The object-oriented reconfigurable system of claim 13, wherein a change in a kernel of said plurality of kernels results in a change in the software object associated with that kernel.

Claim 70 (Previously Presented): The method of claim 29, further comprising the step of updating an attribute value of a software object in said plurality of software objects in accordance with a change in a state of the kernel associated with that software object.

Claim 71 (Previously Presented): The computer program product of claim 37, further comprising:

instructions for updating an attribute value of a software object of said plurality of software objects in accordance with a change in a state of the kernel associated with that software object; and

instructions for updating a software object of said plurality of software objects in accordance with a change in the state of the kernel associated with that software object.

**Claim 72: (Previously Presented):** The method of claim 43, further comprising the step of, in response to a change in a kernel of said plurality of kernels, changing the software object associated with that kernel.

**Claim 73 (Previously Presented):** The computer program product of claim 46, further comprising instructions for, in response to a change in a kernel of said plurality of kernels, changing the software object associated with that kernel.